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NITROGEN

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NITROGEN

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In 2005, U.S. ammonia production was 8.04 million metric tons (Mt) of contained nitrogen, about an 11% decrease from production in 2004. Volatile natural gas prices that resulted from the hurricanes that hit the U.S. Gulf Coast in August and September led to temporary and permanent closures of U.S. ammonia facilities. Apparent consumption was about 2% less than that in 2004. Imports of ammonia were about 10% higher than those in 2004, with most of the imports in 2005 coming from Canada, Trinidad and Tobago, and Ukraine. About 90% of the domestically produced ammonia consumed in the United States was used in fertilizer applications. Global ammonia production in 2005 of 121 Mt of contained nitrogen was about 3% higher than that in 2004. China, India, Russia, and the United States were the leading producers, together accounting for about 55% of the total.

Legislation and Government Programs

The Energy Policy Act of 2005 (Public Law 109-58) was signed by the President on August 8. One of the provisions in the law requires that gasoline sold in the United States contain specified quantities of ethanol, increasing from 4.0 billion gallons in 2006 to 7.5 billion gallons by 2012 (U.S. Congress, 2005). Because ethanol is derived primarily from corn, increased corn production for ethanol would lead to increased nitrogen fertilizer use.

In its sunset reviews of antidumping duties on urea from Russia and Ukraine, the U.S. Department of Commerce, International Trade Administration (ITA) determined that revocation of the antidumping orders would lead to a continuation or recurrence of dumping. As a result, the antidumping duties on urea from Russia and Ukraine remained at 53.23% ad valorem for Phillip Brothers Ltd. and 68.26% ad valorem for all other exporters (U.S. Department of Commerce, International Trade Administration, 2005a, b).

In April, the ITA also initiated a sunset review of antidumping duties on ammonium nitrate from Russia. This investigation was expected to be completed by early 2006. The ITA had suspended the antidumping duty investigation on ammonium nitrate from Russia effective May 19, 2000, because of an agreement between the ITA and Russia's Ministry of Trade. Under this agreement, the Ministry agreed to restrict exports of ammonium nitrate from all Russian producers and exporters to the United States and to ensure that such exports are sold at or above an agreed reference price.

Production

Industry statistics for anhydrous ammonia and derivative products were developed by the U.S. Census Bureau. A summary of the production of principal inorganic fertilizers by quarter was reported in the series MQ325B. The report on industrial gases (including nitrogen), MQ325C, was discontinued at the end of 2004. In 2005, production of anhydrous ammonia (82.2% nitrogen) fell by 11% to 8.04 Mt of contained nitrogen compared with a revised figure of 8.99 Mt in 2004 (table 1). Of the total production, 90% was for use as a fertilizer; the remaining 10% was used in other chemical and industrial sectors (table 2).

The United States was a leading producer and consumer of elemental and fixed types of nitrogen. In declining order, ammonium phosphates [diammonium phosphate (DAP) and monoammonium phosphate], urea, ammonium nitrate, nitric acid, and ammonium sulfate were the major downstream products produced from ammonia in the United States. Their combined production was 8.91 Mt of contained nitrogen, with ammonium phosphates and urea each accounting for about 27% of the production (table 3).

Ammonia producers in the United States operated only at about 61% of design capacity in 2005; this percentage included capacities at plants that operated during any part of the year and does not include plants that were idle for all of 2005. Of the total available U.S. ammonia production capacity, almost 55% was concentrated in the States of Louisiana (33%), Oklahoma (16%), and Texas (6%) where there are large reserves of feedstock natural gas. Koch Nitrogen Co., Terra Industries Inc., CF Industries Inc., Agrium Inc., and PCS Nitrogen Inc., in descending order, accounted for 81% of total U.S. ammonia production capacity (table 4).

The Henry Hub natural gas price experienced wild swings and a significant increase, which resulted in the shutdown of several U.S. ammonia production facilities, particularly in the second half of 2005. The Henry Hub price ranged from a low of $5.53 per million British thermal units at the beginning of the year to a high of $15.27 per million British thermal units at the end of September—nearly a $10 increase. The increased cost of natural gas primarily was the result of refinery shutdowns caused by Hurricanes Katrina and Rita. Although structural damage to ammonia plants from the Gulf Coast hurricanes was minimal, two were closed because of a disruption in natural gas supplies. Terra Industries' Yazoo City, MS, nitrogen facility was shut down for the first 2 weeks of September, and El Dorado Chemical Co.'s Cherokee, AL, facility was closed for about 1 month.

In May, Terra Industries announced that it would mothball its 454,000-metric-ton-per-year (t/yr) Donaldsonville, LA, ammonia plant. The plant was acquired from Mississippi Chemical Corp. in 2004 and had last operated in December 2004. Mississippi Chemical had operated the plant as a swing ammonia producer, and Terra Industries determined that volatile natural gas prices had made operating the facility as a swing producer uneconomical. Before its sale to Terra Industries, Mississippi Chemical had closed a separate ammonia and urea plant at the Donaldsonville site, and the second closure

completed the transition from a manufacturing facility to a facility used only as a storage and distribution terminal. Terra Industries also announced that it would purchase ammonia from Yara International ASA for delivery to Donaldsonville. The purchase quantities were about the same as the mothballed production capacity (Green Markets, 2005i).

In November, Terra Industries announced that it had indefinitely suspended ammonia production at its 399,000-t/yr Woodward, OK, facility. The plant would undergo mechanical repairs and catalyst changes, but would not reopen because of high natural gas costs (Green Markets, 2005j). In December, Agrium announced that it would close its 490,000-t/yr Borger, TX, ammonia facility because of high natural gas prices. By the end of 2005, CF Industries was operating its 2.04-million-metric-ton-per-year (Mt/yr) Donaldsonville ammonia plant at 50% of its rated capacity, Dakota Gasification Co.'s 363,000-t/yr Beulah, ND, ammonia facility was offline, and several other plants were operating at reduced capacity (Green Markets, 2005d).

After several months of negotiations, Agrium completed a natural gas supply contract with Alaska's Cook Inlet producers in July that would allow the company to continue operating its Kenai, AK, ammonia plant at one-half its 1.25-Mt/yr capacity through November 2006. Agrium's contract with Unocal Corp. for natural gas for the plant was set to expire on October 31, 2005 (Green Markets, 2005c). Because of the tenuous supply of natural gas, Agrium planned to conduct a feasibility study on the potential use of coal gasification products as feedstock for the Kenai nitrogen complex. The proposed project would use local low-sulfur coal to produce feedstock, generate electricity that could be sold, and generate carbon dioxide that could be used in gas and oil exploration (Green Markets, 2005b). Agrium also was investigating constructing a nitrogen complex in Egypt to replace the Kenai plant. The company had an agreement on natural gas supply with the Egyptian Government and was expected to reach a decision by mid-2006 (Fertilizer Week, 2005i).

Rising security costs and concerns prompted some companies to stop marketing ammonium nitrate. In January, J.R. Simplot Co. announced that it would discontinue marketing fertilizer-grade ammonium nitrate to its United States and Canadian customers after the spring planting season. As a result of this decision, the company's Brandon, Manitoba, Canada, plant, which supplied these markets, would increase production of its other products—urea ammonium nitrate (UAN) solutions and urea—and produce only a small quantity of ammonium nitrate for blending (Green Markets, 2005h). In July, Agrium announced that it would discontinue production and sales of fertilizer-grade ammonium nitrate. The company produced ammonium nitrate at its Beatrice, NE, facility (Green Markets, 2005a). Wilbur-Ellis Co., an international distributor of agricultural products, also announced that it would no longer market ammonium nitrate for fertilizer applications as of December 31, 2005, and Air Products and Chemicals Inc. was looking for a buyer for its Pace, FL, ammonium nitrate production facility (Green Markets, 2005l). Yara North America Inc. announced that it would stop selling fertilizer-grade ammonium nitrate in California because of security concerns and rising cost associated with security regulations. By yearend, the only firms producing ammonium nitrate in the United States were El Dorado and Terra Industries.

Environment

Hypoxia has become a controversial environmental concern for the fertilizer industry and an issue that spawned significant research efforts to determine its cause. Hypoxia refers to the phenomenon that happens where water near the bottom of an affected area contains less than 2 parts per million of dissolved oxygen. Hypoxia can cause stress or death in bottom-dwelling organisms that cannot move out of the hypoxic zone. Some studies postulated that nitrate runoff from fertilizers is the principal cause of hypoxia, while others cited other causes for the hypoxic zone.

Consumption

In 2005, apparent consumption of ammonia of 14.1 Mt of contained nitrogen was about 2% lower than that in 2004. Apparent consumption is calculated as the production plus imports minus exports, adjusted to reflect any changes in stocks. Consumption of nitrogen fertilizers in the United States for the 2005 crop year (ending June 30, 2005) is listed in table 5. Consumption of 11.3 Mt of contained nitrogen was about 5% lower than that of 2004. Anhydrous ammonia and nitrogen solutions, mostly UAN containing 29.8% to 29.9% nitrogen, were the principal fertilizer products, each representing 25% of fertilizer consumption. Urea (45.9% nitrogen) constituted 19% of fertilizer consumption during the 2005 crop year. Ammonium nitrate containing 33.9% nitrogen constituted 4% of 2005 nitrogen fertilizer consumption, and fertilizer consumption of ammonium sulfate, based on nitrogen content, was 2% of the total U.S. nitrogen-base fertilizer market. The leading nitrogen-consuming States in the 2005 crop year were, in descending order, Iowa, Illinois, Nebraska, Kansas, and California. Together, these five States accounted for 38% of the nitrogen-containing fertilizer consumption in the United States.

Stocks

Stocks of ammonia at yearend 2005 were 197,000 metric tons (t), a decrease of 34% from comparable stocks at yearend 2004, according to data published by the U.S. Census Bureau (table 6).

Transportation

Ammonia was transported by refrigerated barge, rail, pipeline, and truck. Three companies served 11 States with 5,090 kilometers (km) of pipelines and 4,800 km of river barge transport; rail and truck were used primarily for interstate or local delivery.

Valero L.P. operated the Gulf Central ammonia pipeline. The 3,200-km pipeline originates in the Louisiana Delta area and has access to three marine terminals. It moves north through Louisiana and Arkansas into Missouri, where it splits at Hermann, MO, one branch going east into Illinois and Indiana and the other branch continuing north into Iowa and then turning west into Nebraska. The capacity of this pipeline was about 2 Mt/yr, with a storage capacity of more than 1 Mt. CF Industries and Cargill Fertilizer Inc. jointly operated the 135-km Tampa Bay Pipeline (TBP) system. The TBP moved nitrogen compounds and ammonium phosphate for fertilizer producers in Hillsborough and Polk Counties, FL. Magellan Midstream Partners LP's 1,750-km ammonia pipeline,

which originates at production facilities in Borger and in Verdigris and Enid, OK, and terminates in Mankato, MN, has a maximum delivery capacity of about 820,000 t/yr. It transports ammonia to 13 delivery points along the pipeline system and has a storage capacity of about 500,000 t. In 2005, 692,000 t of ammonia was shipped through Magellan's pipeline, compared with 646,000 t in 2004 (Magellan Midstream Partners L.P., 2006§[1]).

Prices

Midyear and yearend prices for nitrogen materials are listed in table 7, and the relationship between the natural gas price and Gulf Coast ammonia price is shown in figure 1. Natural gas prices increased significantly as a result of the damage caused to the U.S. refining industry by the Gulf Coast hurricanes in August and September. Hurricane Katrina caused significant direct damage to offshore rigs, refineries, pipelines, and ports in the Gulf of Mexico, accompanied by wide-scale electricity outages and flooding. Katrina initially reduced natural gas supplies by an estimated 8.8 billion cubic feet per day because of shut-ins as well as direct damage. Hurricane Rita resulted in more than a dozen natural gas processing plants going offline because of flooding, a lack of supplies, an inability to move stored liquids, or safety precautions. Natural gas pipelines sustained significant damage, and the Sabine Pipeline (operator of the Henry Hub) implemented a force majeure. By the end of December, the U.S. Department of Energy (DOE), Energy Information Administration (2006a§) reported that approximately 19.5% of Federal Gulf of Mexico natural gas production remained shut-in because of Hurricanes Katrina and Rita.

Average Gulf Coast ammonia prices began the year at $285 per short ton ($314 per metric ton), fell through January to reach a low for the year of $215 per short ton ($237 per metric ton) at the end of the month. Prices rose through February and March, then leveled off. After the hurricanes hit the Gulf Coast, prices increased rapidly to reach the high for the year of $403 per short ton ($444 per metric ton) by the beginning of November. By the end of 2005, the average ammonia price had fallen to $360 per short ton ($397 per metric ton)

Granular urea prices rose fairly steadily though 2005. At the beginning of the year the price was $224 per short ton ($247 per metric ton). The price reached its high for the year of $278 per short ton ($306 per metric ton) at the beginning of October, then fell slightly to end the year at $264 per short ton ($291 per metric ton).

Ammonium nitrate prices increased slowly for the first half of 2005. The average price increased from its low of $203 per short ton ($224 per metric ton) at the beginning of the year and stabilized at $225 per short ton ($248 per metric ton) at the beginning of June. After the hurricanes, the price immediately rose by $50 per short ton and continued to increase until it reached $268 per short ton ($295 per metric ton) at yearend, which was the high price for the year.

Ammonium sulfate prices, however, did not follow the upward trend of other nitrogen products, mainly because a substantial portion of the material is produced as a byproduct of caprolactam production. The average price rose steadily through the end of May from $185 per short ton ($204 per metric ton) to its high for the year of $214 per short ton ($236 per metric ton). It remained at this level until mid-July, when it fell by about $40 per short ton, then continued to increase to a yearend price of $198 per short ton ($218 per metric ton).

Foreign Trade

Ammonia exports were about 38% higher than those in 2004 (table 8). The Republic of Korea continued to be the leading destination for U.S. exports of ammonia, accounting for 86% of the total. Most of the material shipped to the Republic of Korea was produced at the Agrium plant in Alaska.

Ammonia imports were 10% higher than those in 2004 and were more than 12 times greater than the quantity of exports. The average value of ammonia imports increased to $310 per metric ton from $262 per metric ton in 2004 (table 9). Trinidad and Tobago (57%) continued to be the leading import source. Canada (17%) and Ukraine (15%) were the remaining significant import sources.

Tables 10 and 11 list trade data for other nitrogen materials and include information on principal source or destination countries. Exports of nitrogen materials declined in 2005, with the exception of ammonia and DAP. Changes in import quantities of nitrogen materials were mixed compared with imports in 2004. In general, the materials with the largest quantity of imports (ammonia, nitrogen solutions, and urea) had increased imports from those in 2004.

World Review

Anhydrous ammonia and other nitrogen materials were produced in more than 80 countries. Global ammonia production in 2005 of 121 Mt was about 3% higher than that of 2004 (table 12). A significant portion of this increase resulted from a 3.0-Mt increase in production from China, which, with 31% of total production, was the leading world producer of ammonia. Asia contributed 49% of total world ammonia production, and the Commonwealth of Independent States (CIS), Estonia, and Lithuania produced 14% of the global total. North America represented 10% of the total; Western Europe, 8%; Central America and South America and the Middle East, 6% each; and Africa, Eastern Europe, and Oceania together contributed the remaining 7%.

Algeria.—Spain's Fertiberia S.A. planned to invest $316 million to build a new 1.1-Mt/yr ammonia plant in Arzew. Plant completion was scheduled for 2009. Fertiberia operated a 370,000-t/yr ammonia plant near Huelva, Spain (Nitrogen & Methanol, 2005).

Argentina.—Profértil S.A. announced that it would invest $60 million to construct a UAN solution plant at Bahia Blanca. The company planned to use ammonia from the existing nitrogen complex at the site to produce nitric acid, which is required to produce UAN solution. Profértil estimated that the plant's capacity could reach 500,000 t/yr of UAN solution in 2007 (Fertilizer Week America, 2005).

Australia.—In April, Burrup Fertilisers Pty. Ltd. announced that it was considering building a second fertilizer plant in Western Australia that would be at least twice the size of its $630 million 760,000-t/yr ammonia plant nearing completion on the Burrup Peninsula. Burrup was evaluating potential plant sites in Western Australia and the Middle East, but the final location would

[1]References that include a section mark (§) are found in the Internet References Cited section.

depend on competitive gas supplies. The second project would incorporate two trains and also produce urea and ammonium nitrate. Preliminary talks with prospective suppliers had begun, and a feasibility study would take at least 12 to 14 months to complete from July, suggesting a production startup toward the end of the decade. In addition, Norway's Yara International, which had an offtake agreement for 100% of the ammonia produced from Burrup's nearly completed plant, acquired a 30% stake in Burrup for about $100 million (Burrup Fertilisers Pty. Ltd., 2005§).

In November, Wesfarmers Ltd. announced that it would double its ammonium nitrate production at Kwinana, Western Australia, to 470,000 t/yr by 2007. The cost of the expansion was estimated to be $146 million. More than one-half of the plant's output would be explosives-grade ammonium nitrate, and the rest would be used to make a variety of liquid fertilizers (Fertilizer Week, 2005l).

Bulgaria.—Two rehabilitation plans were submitted for nitrogen producer Chimco AD subject to approval by Chimco's creditors. Novo Chimco AD's plan included delivery of gas directly to the plant from Russia's Gazexport. Inter RAO Bulgaria (a subsidiary of Russian company RAO United Energy Systems) submitted a separate rehabilitation plan for the fertilizer plant. The main creditors of Chimco included the state-owned gas supplier Bulgargaz EAD and National Electric Co. (Sofia Echo, 2005§). After a September 30 meeting, creditors of Chimco chose the rehabilitation scheme submitted by Novo Chimco over that of Inter RAO Bulgaria. Chimco's debt to Bulgargaz and National Electric, totaling lev151 million ($92.2 million), will be reset for 18 years. In return, Novo Chimco will become sole owner, and the shares of 7,000 small investors will be canceled (Internet Bankruptcy Library, 2005§).

Canada.—Methanex Corp. announced that it would close its Kitimat, British Columbia, 280,000-t/yr ammonia and 500,000-t/yr methanol plants on November 1 because of the volatile cost of natural gas. The plant was shut down 2 months earlier than the planned date of January 2006 because Methanex reached an agreement with Mitsui & Co., Ltd., which was Methanex's buyer of ammonia produced at Kitimat. The company planned to convert the site to a terminal operation (Green Markets, 2005g).

Egypt.—The U.S. Export-Import Bank approved a $229.8 million long-term guarantee to support construction of a $540 million ammonia plant in Egypt by Kellogg, Brown and Root (a subsidiary of Halliburton Inc.) and other United States companies. The new plant will be constructed for Egypt Basic Industries Corp. and will produce 2,000 metric tons per day (t/d) of ammonia. Kellogg, Brown and Root, PSK Holdings (an Egyptian petrochemical company), Orascom Construction Industries (an Egyptian construction firm), and Egyptian General Petroleum Corp. (the state-owned oil and gas company) were expected to be the plant's owners. In October, Orascom invested $57 million in the project to become the leading shareholder, with a 30% stake. The planned facility, which was expected to be completed by 2008, will be connected by pipeline to product storage tanks in Sokhna Port (Green Markets, 2005k).

Georgia.—In March, Georgia's Ministry of Economic Development announced that nitrogen producer RustaviAzot would be offered for privatization, with expressions of interest due to the Ministry by May 2. Russian energy firm Itera Holdings Ltd. had taken a 90% ownership in RustaviAzot in 2002 for $0.5 million, which was conditional on investing $13.7 million in the facility during 2 years of ownership and writing off a $46 million gas supply debt. The Georgian Government said that none of these financial obligations had been honored, and Itera claimed that the Georgian Government did not honor its obligation to pay off its debt to Itera, which was estimated to be $60 million. By yearend, no determination on privatization had been resolved (Fertilizer Week, 2005e).

India.—Deepak Fertilisers and Petrochemicals Corp. Ltd. announced plans to construct a 300,000-t/yr ammonium nitrate plant in eastern India. The company planned to supply the domestic mining and construction industries and similar markets in Southeast Asia and Australia. Estimated annual domestic demand for ammonium nitrate was 450,000 t/yr, with domestic production supplying about 265,000 t/yr. The project was expected to require 24 months to complete and would cost $87 million. A final location was not selected, and no timetable was set for the start of construction (Fertilizer Week, 2005c). Deepak operated a 90,000-t/yr ammonium nitrate facility at Taloja.

Rashtriya Chemicals and Fertilizers Ltd. (RCF) planned to invest $453 million in a 2,000-t/d-ammonia and 3,200-t/d-urea plant with power generation, offsite utilities, and product handling facilities at an existing plant site in Thal, Maharashtra State. The company completed a feasibility study, and a proposal was submitted to the Government for approval. RCF also planned to improve energy consumption at its Trombay, Maharashtra State, ammonia and urea complex. This upgrade was expected to be completed by April 2006 (Rashtriya Chemicals and Fertilizers Ltd., 2005§).

Indonesia.—The Indonesian Government received permission from its partners in the Asean Aceh Fertilizer facility (Malaysia, the Philippines, Singapore, and Thailand) to close the plant. The plant was originally opened in 1984 to ensure an adequate supply of urea to member states of the Association of South East Asian Nations, but had been closed for more than 1 year because of a rate dispute with ExxonMobil Corp. and the Indonesian supplier of natural gas (Green Markets, 2005f).

Iran.—Ghadir Urea/Ammonia Petrochemical Co. (a joint venture between Iran's National Petrochemical Co. and Ghadir Investment Co.) started precommissioning work on its ammonia-urea complex in Assaluyeh in December. The complex was expected to begin commercial operation in the first quarter of 2006, with a capacity of 680,000 t/yr of ammonia and 1.08 Mt/yr of urea (Viswanathan, 2005).

Nigeria.—India's Nagarjuna Fertilizers and Chemicals Ltd. (NFCL) reached a preliminary agreement with the Nigerian Government to invest $1.2 billion to construct two urea plants with a capacity of 1 Mt/yr; the Government would build the infrastructure required, including roads and water and electrical generation facilities. NFCL would build the plants in Kwara and Cross River States. The Kwara State government reportedly set aside 100 hectares of land near Jebba for the first plant, for which construction would begin in April 2006. This plant would supply domestic needs. The second plant in Cross River State would provide urea for export because of its proximity to the country's Export Processing Zone (Fertilizer Week, 2005g).

In August, Nigeria's Bureau of Public Enterprises sold Government-owned National Fertiliser Co. of Nigeria for $152

million to O-Secul Fertiliser Co. Ltd. Several unsuccessful attempts were made in 2003 and 2004 to privatize the operation (BusinessDay Online, 2005§). The plant has been idled since 1995 and had the capacity to produce 1,000 t/d of ammonia and 1,500 t/d of urea.

Oman.—In July, Oman India Fertiliser Co. SAOC's (OMIFCO) new ammonia-urea complex at Sur started commercial production. Design capacity at the plant was 3,500 t/d of ammonia and 5,060 t/d of urea using natural gas as feedstock. The urea and surplus ammonia will be shipped to India. OMIFCO is owned 50% by Oman Oil Co. SAOC, 25% by Indian Farmers Fertiliser Cooperative Ltd., and 25% by Krishak Bharati Cooperative Ltd. (Oman India Fertiliser Co. SAOC, undated §).

Pakistan.—Reliance Export (a consortium between Fatima Group and Arif Habib Group) submitted the highest offer for Pak Arab Fertilizer Ltd., $237.6 million, and was awarded 94.8% of the company by the country's Cabinet Committee on Privatisation. The remaining 5.2% of the company was retained by the workers' union. Pak Arab had the capacity to produce 92,000 t/yr of urea and downstream products, such as calcium ammonium nitrate and nitrophosphates, which were marketed domestically. The consortium planned to increase capacity at the plant at an unspecified future date (Fertilizer Week, 2005d).

Qatar.—Yara International and Qatar Fertiliser Co. (Qafco) signed a letter of intent with Qatar Petroleum Co. to build Qafco-V, a 1-Mt/yr-ammonia and 1.1-Mt/yr-urea plant, which is supported by a new 25-year gas contract between the partners and Qatar Petroleum. A final decision on the project was expected in 2006, with completion scheduled for 2009 or 2010. In mid-2004, Qafco opened Qafco-IV, which brought the company's total production capacity to 2 Mt/yr of ammonia and 2.8 Mt/yr of urea. Qafco was owned 75% by Industries of Qatar and 25% by Yara International. Yara was marketing 50% of the urea produced by Qafco, and the remainder was sold by Qafco (Fertilizer Week, 2005n).

Romania.—At the end of November, the Romanian privatization agency was conducting talks with two bidders for a 79.05% ownership of Nitramonia—Nitrogénmüvek Rt. of Hungary and S.C. Agrosem S.A. Timisoara of Romania. These companies also were bidding for the five subsidiaries S.C. Nitrofertilizer S.A., S.C. Nitroexplosives S.A., S.C. Nitrocontrol S.A., S.C. Nitroservice S.A. and S.C. Nitrotrans S.A. (Authority for State Assets Recovery [Romania], The, 2005§).

Russia.—JSC Acron was planning to invest $1.39 billion in a 10-year modernization of its fertilizer production facilities in Novogorod and Dorogobuzh. Funding was expected to be 50% from profits and 50% from loans from banks in Austria, Germany, and Russia. The fertilizer producer also may sell some shares in the company, which was established in 1967. In Novgorod, Acron was planning to complete a 700,000-t/yr ammonia plant after construction was halted in 1989. By yearend 2005, Haldor Topsøe A/S had almost completed a feasibility study of the $170 million project, which was scheduled for completion in 2008. Together with an existing ammonia unit in Novgorod, total ammonia production will reach l Mt/yr. A $25 million urea plant will be upgraded by the end of 2006, adding 150,000 t/yr of capacity to reach a total of 550,000 t/yr. In Dorogubuzh, Acron was planning a $15 million expansion of ammonia production capacity to 550,000 t/yr. It also planned to construct a new 700,000-t/yr ammonia unit during 2008-09 at cost of $245 million. Upgrades and expansions of formaldehyde, melamine, and methanol plants were also scheduled, along with upgrades of power facilities (Fertilizer Week, 2005a). Acron also planned to build an ammonia terminal at one of the Baltic Sea ports to expand export sales. Capacity at the new terminal was expected to be 1 Mt—about one-half would be for storage of Acron's product and the rest would be for storage of ammonia from other Russian producers. At yearend, the company was completing a feasibility study for siting the terminal (Fertilizer Week, 2005b).

Yara International entered a partnership with Russian fertilizer producer OAO Minudobreniya (Rossosh). The agreement included a 30% stock acquisition, technology transfer, and the integration of Rossosh into Yara International's planning and marketing operations. The Rossosh plant, which is based on nitrophosphate technology licensed from Yara International in the early 1980s, has a total production capacity of 800,000 t/yr of ammonia. One-half of the ammonia was upgraded to ammonium nitrate and nitrophosphate fertilizers, and the remainder was sold on the open market. The partnership agreement also will give Yara International access to competitively priced energy and other raw materials (Fertilizer Week, 2005m).

Trinidad and Tobago.—Low natural gas prices in the country, compared with those in the United States, have continued to stimulate interest in developing new ammonia and urea production capacity in Trinidad. In April, Terra Industries announced that Terra Industries, CF Industries, and Trinidad-based ANSA McAL Ltd. were studying the construction of an ammonia-UAN manufacturing facility in Trinidad and Tobago. National Energy Corp. of Trinidad and Tobago Ltd. designated a site for the facility at Union Estate, and the parties have negotiated a long-term natural gas supply with National Gas Co. of Trinidad and Tobago. German engineering firm Uhde GmbH was selected to perform engineering work and estimate the project's cost (Fertilizer International, 2005).

In February, the Government of Trinidad and Tobago signed a memorandum of understanding (MOU) with La Brea Nitrogen Ltd. to construct a $550 million nitrogen complex at Union Estate. Capacity at the plant was projected to be 720,000 t/yr of ammonia, with one-half of the ammonia production upgraded to 915,000 t/yr of UAN. Construction of the new facility was expected to begin by the end of 2005, with completion scheduled for 2008. La Brea Nitrogen was owned by a single family, but the ownership goal was to have 50% owned by local interests (Green Markets, 2005e).

Coffeyville Resources LLC also signed an MOU with the Government of Trinidad and Tobago to construct an ammonia-UAN complex in Union Estate. Total capacity of the plants was projected to be 1.5 Mt/yr of ammonia and 2 Mt/yr of UAN. Costs, technology, and a timetable for construction of the new plants were not announced (Fertilizer Week, 2005f). If the four new plants proposed in 2004 and 2005 are built, the country's ammonia production capacity was expected to increase by 3.4 to 3.5 Mt/yr.

Turkmenistan.—After state-owned Turkmendokunkhimiya's new 600-t/d ammonia and 1,050-t/d urea project at Tedžen was inaugurated in 2004, the country's President announced that an additional 150,000-t/yr of urea capacity was planned. This new plant would produce urea for export (Fertilizer Week, 2005j).

Construction of a new $74.6 million urea plant with a 400,000-t/yr capacity began in September in Mary Province. The new plant was expected to be commissioned in February 2008. In addition, expansion of the existing ammonia plant would add 200,000 t/yr of production capacity. The total cost of the new construction was estimated to be $210 million (News Central Asia.com, 2005§).

Ukraine.—The Government announced that it intended to privatize the Odessa Port Plant in 2006 for an expected $1 billion. The plant is the second ranked ammonia producer in the country; more than 90% of the plant's output was exported to Europe and the United States (Fertilizer Week, 2005h).

United Arab Emirates.—Oman Chemicals and Pharmaceuticals LLC announced plans to construct a $200 million ammonia and urea plant in Sharjah's Hamriyah Free Zone. The first phase of production of 400,000-t/yr of ammonia was expected to start by April 2007, and phase two production of urea and other products was scheduled to start in 2008. Natural gas for the operation was expected to be purchased for $1.50 per million British thermal units (Nitrogen + Syngas, 2005a)

Ruwais Fertilizer Industries (a joint venture between Abu Dhabi National Oil Co. and Total S.A.) debottlenecked its 610,000-t/yr urea unit and initiated a feasibility study of a $50 million expansion of its facilities to produce ammonia and granulated urea. The additional urea would feed the company's melamine unit (Nitrogen + Syngas, 2005b)

United Kingdom.—Terra Industries announced in November that it suspended ammonia production at its facility at Billingham, Teesside, and it is operating its other facility at Severnside, Bristol, at reduced rates because of the high price of natural gas in the United Kingdom. Terra Industries did not anticipate resuming ammonia production until natural gas costs decrease to a level that allows the ammonia unit to operate with positive cash flow. The company expected to fulfill its British sales commitments from its own inventories and with imported ammonia, some of which would be upgraded to ammonium nitrate (Terra Industries Inc., 2005§). High natural gas prices also prompted the closure of Kemira GrowHow Oyj's 354,000-t/yr Ince ammonia plant during the fourth quarter of 2005.

Venezuela.—In June, Corporatión Petroquímica de Venezuela S.A. (CPV) restarted its El Tablazo ammonia-urea complex that had been idle since 2001, citing rising world ammonia prices as the main reason. CPV restarted one of two ammonia-urea units after a $93 million refurbishment. Ammonia capacity was estimated to be 298,000 t/yr, and urea capacity was estimated to be 360,000 t/yr (Nitrogen + Syngas, 2005c).

Vietnam.—Vietnam National Chemical Corp. received final Governmental approval to construct a coal-based 560,000-t/yr prilled urea plant in northern Ninh Binh Province. The project was expected to cost $400 million and was scheduled to start operations at the end of 2008 or in early 2009. The company had originally planned to build the plant in Bac Gang Province, but the coal transportation infrastructure in Ninh Binh Province was more developed (Fertilizer Week, 2005k).

Current Research and Technology

Researchers at the University of Missouri-Columbia were using light-emitting diodes (LEDs) to measure the color of young corn accurately and apply variable rates of nitrogen according to plant needs. They hope this LED approach will not only increase profits for producers, but also create a healthier environment by minimizing excess nitrogen runoff. In the study, researchers applied an ample amount of nitrogen in early spring to only one area of the field. LED devices mounted on a fertilizer applicator measured light reflected from small (12- to 15-inch) corn plants in this area, providing a reference or baseline point. Variable rates of nitrogen are applied to the rest of the crop by a computer-equipped applicator, depending on the color or reflective value of corn leaves detected by the LEDs (University of Missouri-Columbia, 2005§).

New findings from researchers at the U.S. Department of Agriculture (USDA) Agricultural Research Service show that a beneficial soil fungus plays a large role in nitrogen uptake and utilization in most plants. Arbuscular mycorrhizal fungi transfer substantial amounts of nitrogen to their plant hosts. The researchers discovered a novel metabolic pathway in which inorganic nitrogen is taken up by the fungi and incorporated into the amino acid arginine. Arginine remains in the fungus until it is broken down and transferred to the plant. The results show that the symbiotic relationship between mycorrhizal fungi and plants may have a much more significant role in the worldwide nitrogen cycle than previously believed. As a result, farmers may benefit from promoting the proliferation of mycorrhizal fungi, thereby making more efficient use of the nitrogen stores in agricultural soils (U.S. Department of Agriculture, Agricultural Research Service, 2005§).

Outlook

Corn growers intended to plant 31.6 million hectares (Mha) of corn for all purposes in the 2006 crop year (July 1, 2006-June 30, 2007), 5% less than that in the 2005 crop year (U.S. Department of Agriculture, National Agricultural Statistical Service, 2006§). If this estimate is accurate, this will be the lowest corn acreage planted since the 2001 crop year when 30.6 Mha was planted for all purposes. The forecast for planted corn was lower than that in 2005 in most States because producers intended to switch to other, less input-intensive crops because of high fertilizer and fuel costs. Dry conditions also contributed to lower planting intentions in the southern Great Plains. With these 2006 projections, nitrogen consumption by the fertilizer industry is expected to be slightly lower than that in 2005.

According to long-term projections by the USDA Economic Research Service, projected plantings for the eight major field crops in the United States would increase from the 2005 level of about 98.3 Mha, remaining near 99.2 Mha throughout the projections (U.S. Department of Agriculture, Economic Research Service, 2006§) (figure 2). Yield increases also were projected to contribute to production gains, limiting price increases, and thereby reducing the need for more land to be planted. Corn, soybeans, and wheat would account for about 87% of area planted for the eight major field crops. During the 10-year period, the crop mix was expected to shift to corn and away from soybeans. Corn used to produce ethanol in the United States was projected to more than double by 2015-16 from the 2004-05 level. This increase reflects the effect of the Renewable Fuel Program authorized under the Energy Policy Act of 2005, large ongoing ethanol plant construction, and economic incentives provided by continued high oil prices. (A 51-cent-per-gallon subsidy

for ethanol producers, which had been enacted in 2004 for production up to 15,000 gallons per year, was extended to production up to 60,000 gallons per year in the 2005 legislation.) Increased feeding of distillers dried grains, a coproduct of dry mill ethanol production, would help meet growing livestock feed demand. Thus, feed use of corn would rise only slowly in the projections.

Natural gas prices are expected to continue to be the most important factor in U.S. ammonia production. If natural gas prices remain at high levels, then ammonia production capacity at older, higher cost plants in the United States will most likely continue to close. (From the beginning of 2001, when natural gas prices began to spike in the winter, until the end of 2005, U.S. ammonia production capacity has declined by 3.7 Mt/yr, or 21% of the 2001 capacity.) The interest that United States firms have shown in constructing new plants outside the United States, particularly in Trinidad and Tobago, indicated that, in the future, much of the United States supply of ammonia was expected to be supplied by foreign production. The DOE projected that, barring extreme weather conditions, spot natural gas prices should ease in 2006, leading to an annual average decline in the Henry Hub price to about $8.11 per million cubic feet ($7.87 per million British thermal units). The respite was expected to be short-lived. The DOE projected that concerns about potential future supply tightness and continuing pressure from high oil prices would drive spot natural gas prices for the next heating season to previous highs, with the Henry Hub spot price rising to about $11.00 per million cubic feet ($10.67 per million British thermal units). The Henry Hub price was expected to average approximately $9.17 per million cubic feet ($8.89 per million British thermal units) in 2007 (U.S. Department of Energy, Energy Information Administration, 2006b§).

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TABLE 1
SALIENT AMMONIA STATISTICS[1, 2]

(Thousand metric tons of contained nitrogen unless otherwise specified)

	2001	2002	2003	2004	2005
United States:					
Production	9,120	10,300	8,450 r	8,990 r	8,040 p
Exports	647	437	400	381	525
Imports for consumption	4,550	4,670	5,720	5,900	6,520
Consumption, apparent[3]	13,200	14,500	13,900 r	14,400 r	14,100 p
Stocks, December 31, producers'	261	286	195 r	298 r	197 p
Average annual price, free on board Gulf Coast[4] dollars per short ton	183	137	245	274	314
Net import reliance as a percentage of apparent consumption[5]	31	29	39	38	43 p
Natural gas price, wellhead, average price[6] dollars per thousand cubic feet	4.00	2.95	4.88	5.46 r	7.51 e
World:					
Production	105,000	109,000	110,000	117,000	121,000 e
Trade[7]	12,600	12,900	13,900	14,600	NA

eEstimated. pPreliminary. rRevised. NA Not available.

[1]Data are rounded to no more than three significant digits.

[2]Synthetic anhydrous ammonia, excluding coke oven byproduct; data are for calendar year and are from the U.S. Census Bureau unless otherwise noted.

[3]Calculated from production plus imports minus exports and industry stock changes.

[4]Source: Green Markets.

[5]Defined as imports minus exports; adjusted for industry stock changes.

[6]Source: Monthly Energy Review, U.S. Department of Energy.

[7]Source: International Fertilizer Industry Association Statistics, World Anhydrous Ammonia Trade.

TABLE 2
ANHYDROUS AMMONIA SUPPLY AND DEMAND IN THE UNITED STATES[1]

(Thousand metric tons of contained nitrogen)

	2003	2004	2005[p]
Production:			
Fertilizer:			
January-June	3,720 [r]	4,240 [r]	4,000
July-December	3,770 [r]	4,230 [r]	3,200
Total	7,490 [r]	8,470 [r]	7,190
Nonfertilizer:			
January-June	535 [r]	273 [r]	305
July-December	426 [r]	251 [r]	537
Total	961 [r]	524 [r]	842
Grand total	8,450 [r]	8,990 [r]	8,040
Imports for consumption:			
January-June	2,890	3,060	3,250
July-December	2,820	2,840	3,270
Total	5,720	5,900	6,520
Exports:			
January-June	234	196	250
July-December	166	185	275
Total	400	381	525
Stocks, end of period:			
January-June	238 [r]	228 [r]	196
July-December	195 [r]	298 [r]	197
Apparent consumption:[2]			
January-June	6,960 [r]	7,350 [r]	7,410
July-December	6,900 [r]	7,060 [r]	6,730
Total	13,900 [r]	14,400 [r]	14,100

[p]Preliminary. [r]Revised.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Calculated from production plus imports minus exports and industry stock changes.

Source: U.S. Census Bureau.

TABLE 3
MAJOR DOWNSTREAM NITROGEN COMPOUNDS PRODUCED IN THE UNITED STATES[1, 2]

(Thousand metric tons)

	2004						2005[p]					
	January-June[r]		July-December		Total		January-June		July-December		Total	
	Gross weight	Nitrogen content	Gross weight[r]	Nitrogen content	Gross weight	Nitrogen content	Gross weight	Nitrogen content	Gross weight	Nitrogen content	Gross weight	Nitrogen content
Urea	2,760	1,270	3,000	1,380 [r]	5,760	2,640	2,930	1,340	2,270	1,040	5,190	2,380
Ammonium phosphates[e, 3]	7,780	1,220	7,510	1,190	15,300 [r]	2,400	7,500	1,270	7,050	1,160	14,600	2,430
Ammonium nitrate	3,110	1,060	3,450	1,170 [r]	6,560 [r]	2,220 [r]	3,480	1,180	2,880	975	6,350	2,150
Nitric acid	3,260	717	3,210	706 [r]	6,470 [r]	1,420 [r]	3,450	758	2,890	635	6,330	1,390
Ammonium sulfate[4]	1,420	300	1,310	278 [r]	2,730 [r]	578 [r]	1,320	280	1,260	267	2,580	547

[e]Estimated. [p]Preliminary. [r]Revised.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Ranked in relative order of importance by nitrogen content.

[3]Diammonium phosphate and monoammonium phosphate.

[4]Excludes coke plant ammonium sulfate.

Source: U.S. Census Bureau, Current Industrial Reports MQ325B.

TABLE 4
DOMESTIC PRODUCERS OF ANHYDROUS AMMONIA IN 2005[1]

(Thousand metric tons per year of ammonia)

Company	Location	Capacity[2]
Agrium Inc.	Borger, TX	490
Do.	Finley, WA[3]	180
Do.	Kenai, AK	1,250
CF Industries Inc.	Donaldsonville, LA	2,040
Coffeyville Resources LLC	Coffeyville, KS	375
Dyno Nobel ASA	Cheyenne, WY	174
Do.	St. Helens, OR	101
Dakota Gasification Co.	Beulah, ND	363
El Dorado Chemical Co.	Cherokee, AL	175
Green Valley Chemical Corp.	Creston, IA	32
Honeywell International Inc.	Hopewell, VA	530
Koch Nitrogen Co.	Beatrice, NE	265
Do.	Dodge City, KS	280
Do.	Enid, OK	930
Do.	Fort Dodge, IA	350
Do.	Sterlington, LA	1,110
Mosaic Co., The	Faustina (Donaldsonville), LA	508
Nitromite Fertilizer (Valero Energy Corp.)	Dumas, TX	128
PCS Nitrogen Inc.	Augusta, GA	688
Do.	Geismar, LA[3]	483
Do.	Lima, OH	542
Royster-Clark Inc.	East Dubuque, IL	278
Shoreline Chemical	Gordon, GA	31
Terra Industries Inc.	Beaumont, TX[3]	231
Do.	Donaldsonville (Ampro), LA[4]	454
Do.	Port Neal, IA	336
Do.	Verdigris, OK	953
Do.	Woodward, OK	399
Do.	Yazoo City, MS	454
Total		14,100

[1]Data are rounded to no more than three significant digits; may not add to total shown.
[2]Engineering design capacity adjusted for 340 days per year of effective production capability.
[3]Idle.
[4]Closed in 2005.

TABLE 5

U.S. NITROGEN FERTILIZER CONSUMPTION, BY PRODUCT TYPE[1, 2]

(Thousand metric tons of contained nitrogen)

Fertilizer material[3]	2004	2005[p]
Single-nutrient:		
Nitrogen solutions[4]	3,030 [r]	2,870
Anhydrous ammonia	3,050 [r]	2,860
Urea	2,350 [r]	2,170
Ammonium nitrate	470	437
Ammonium sulfate	233	224
Aqua ammonia	98	79
Other[5]	315	315
Total	9,540 [r]	8,950
Multiple-nutrient[6]	2,360 [r]	2,340
Grand total	11,900 [r]	11,300

[p]Preliminary. [r]Revised.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Fertilizer years ending June 30.

[3]Ranked in relative order of importance by product type.

[4]Principally urea-ammonium nitrate solutions, 29.9% nitrogen.

[5]Includes other single-nutrient nitrogen materials, all natural organics, and statistical discrepencies.

[6]Various combinations of nitrogen (N), phosphate (P), and potassium (K): N-P-K, N-P, and N-K.

Source: Terry, D.L., and Kirby, B.J., 2006, Commercial fertilizers 2005: Lexington, KY, Association of American Plant Control Officials Inc. and The Fertilizer Institute, 41 p.

TABLE 6
U.S. PRODUCER STOCKS OF FIXED NITROGEN COMPOUNDS AT END OF PERIOD

(Thousand metric tons of contained nitrogen)

Material[1]	2004	2005[p]
Ammonia:		
January-June	228 [r]	196
July-December	298 [r]	197
Nitrogen solutions:[2]		
January-June	104 [r]	80
July-December	100 [r]	75
Urea:		
January-June	42 [r]	47
July-December	45 [r]	98
Ammonium phosphates:[3]		
January-June	60 [r]	63
July-December	82	76
Ammonium nitrate:		
January-June	27 [r]	36
July-December	47 [r]	52
Ammonium sulfate:		
January-June	21	22
July-December	18	34
Yearend total[4]	590 [r]	532

[p]Preliminary. [r]Revised.
[1]Ranked in relative order of importance.
[2]Urea-ammonium nitrate and ammoniacal solutions.
[3]Diammonium and monoammonium phosphates.
[4]Calendar year ending December 31.

Source: U.S. Census Bureau, Current Industrial Reports MQ325B.

TABLE 7
PRICE QUOTATIONS FOR MAJOR NITROGEN COMPOUNDS AT END OF PERIOD

(Dollars per short ton)

	2004		2005	
Compound	June	December	June	December
Ammonium nitrate, free on board (f.o.b.) Corn Belt[1]	178-190	195-210	225	265-270
Ammonium sulfate, f.o.b. Corn Belt[1]	165-175	180-190	210-218	195-200
Anhydrous ammonia:				
F.o.b. Corn Belt[1]	295-315	350-370	335-375	475-490
F.o.b. Gulf Coast[2]	270	285	305	360
Diammonium phosphate, f.o.b. central Florida	180-185	205-215	210-213	230-233
Urea:				
F.o.b. Corn Belt,[1] prilled and granular	198-208	255-270	285-300	300-325
F.o.b. Gulf Coast, granular[2]	187-188	225-230	250-255	260-267

[1]Illinois, Indiana, Iowa, Missouri, Nebraska, and Ohio.
[2]Barge, New Orleans, LA.

Source: Green Markets.

TABLE 8
U.S. EXPORTS OF ANHYDROUS AMMONIA, BY COUNTRY[1]

(Thousand metric tons of ammonia)

Country	2004	2005
Canada	10	10
Chile	15	17
China	--	38
Korea, Republic of	383	552
Mexico	16	10
Philippines	24	--
Taiwan	10	8
Other	5	4
Total	463	639

-- Zero.

[1]Value data suppressed by U.S. Census Bureau.

Source: U.S. Census Bureau.

TABLE 9
U.S. IMPORTS OF ANHYDROUS AMMONIA, BY COUNTRY[1]

(Thousand metric tons of ammonia and thousand dollars)

	2004		2005	
Country	Gross weight	Value[2]	Gross weight	Value[2]
Canada	1,280	323,000	1,340	451,000
Indonesia	67	16,900	22	9,120
Latvia	(3)	8,640	118	33,500
Russia	864	212,000	426	136,000
Trinidad and Tobago	3,880	1,030,000	4,490	1,370,000
Ukraine	524	138,000	1,160	349,000
Venezuela	323	87,300	148	44,800
Other	236	66,100	222	66,800
Total	7,180	1,880,000	7,930	2,460,000

-- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Cost, insurance, and freight value.

[3]Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 10
U.S. EXPORTS OF MAJOR NITROGEN COMPOUNDS[1]

(Thousand metric tons)

Compound	2004 Gross weight	2004 Nitrogen content	2005 Gross weight	2005 Nitrogen content	Principal destinations, 2005
Ammonium nitrate[2]	109	37	82	28	Mexico, 64%; Canada, 26%.
Ammonium sulfate[2]	718	194	665	180	Brazil, 41%; Guatemala, 11%; Canada, 10%.
Anhydrous ammonia	463	381	639	525	Republic of Korea, 86%.
Diammonium phosphate	5,040	907	5,620	1,010	China, 24%; India, 21%; Pakistan, 11%.
Monoammonium phosphate	3,420	376	2,890	318	Australia, 22%; Canada, 21%; Brazil, 18%.
Urea	704	323	536	246	Mexico, 59%; Republic of Korea, 25%.
Total	10,500	2,220	10,400	2,310	

[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes industrial chemical products.

Source: U.S. Census Bureau.

TABLE 11
U.S. IMPORTS OF MAJOR NITROGEN COMPOUNDS[1]

(Thousand metric tons and thousand dollars)

Compound	2004 Gross weight	2004 Nitrogen content	2004 Value[2]	2005 Gross weight	2005 Nitrogen content	2005 Value[2]	Principal sources, 2005
Ammonium nitrate[3]	1,060	358	191,000	886	300	189,000	Canada, 61%; Romania, 15%.
Ammonium nitrate-limestone mixtures	2	1	178	2	1	209	Japan, 61%; Netherlands, 27%.
Ammonium sulfate[3]	326	69	37,500	280	59	45,200	Canada, 98%.
Anhydrous ammonia[4]	7,180	5,900	1,880,000	7,930	6,520	2,220,000	Trinidad and Tobago, 57%; Canada, 17%; Ukraine, 15%.
Calcium nitrate	126	21	11,100	119	20	13,100	Norway, 88%; Ukraine, 11%.
Diammonium phosphate	31	6	12,900	10	2	9,130	Mexico, 59%; China, 21%.
Monoammonium phosphate	156	17	48,600	141	16	56,400	Canada, 75%; Mexico, 9%.
Nitrogen solutions	2,010	602	319,000	2,820	844	543,000	Romania, 26%; Russia, 22%; Canada, 15%.
Potassium nitrate	66	9	21,800	87	12	33,900	Chile, 56%; Israel, 39%.
Potassium nitrate-sodium nitrate mixtures	42	6	14,800	6	1	2,250	Israel, 68%; Canada, 30%.
Sodium nitrate	66	11	15,700	71	12	20,000	Chile, 93%.
Urea	4,940	2,270	1,020,000	5,670	2,600	1,540,000	Canada, 31%; Qatar, 13%; Saudi Arabia, 9%.
Total	16,000	9,270	3,580,000	18,000	10,400	4,670,000	

[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Cost, insurance, and freight value.
[3]Includes industrial chemical products.
[4]Includes industrial ammonia.

Source: U.S. Census Bureau.

TABLE 12
AMMONIA: WORLD PRODUCTION, BY COUNTRY[1, 2]

(Thousand metric tons of contained nitrogen)

Country	2001	2002	2003	2004	2005[e]
Afghanistan[e]	20	20	20	20	20
Albania[e]	10	10	10	10	10
Algeria	469	563	578	543 [r]	550
Argentina	597	617	724	701	580
Australia	762	686	787	790	790
Austria[e]	440	440	440	440	440
Bahrain	372	377	312	311	312
Bangladesh[3]	1,273	1,289	1,389	1,380	1,380
Belarus	725	799	726	765 [e]	800 [4]
Belgium	788	842	874	857	860
Bosnia and Herzegovina[e]	1	1	1	1	1
Brazil	769	1,021	939	1,077	1,070
Bulgaria	477	328	321	389	390
Burma	28	21	63	35 [e]	35
Canada	3,439	3,700	3,662	4,107	4,000
China	28,200	30,200	31,500	34,800 [e]	37,800 [p]
Colombia	95	111	108	98	100
Croatia	259	235	264	332	330
Cuba[e]	135	135	135	135	135
Czech Republic	206	215	235	233	233
Denmark[e]	2	2	2	2	2
Egypt	1,801	1,839	1,790	1,675	1,640
Estonia	151	39	81	166	170
Finland[e]	80	87	77 [r]	61 [r]	63
France	1,380 [e]	1,172	1,153	1,120	1,150
Georgia	60	90	125	130 [e]	130
Germany	2,522	2,623	2,803	2,741	2,700
Greece	57	66	123	132	130
Hungary	324	238	232	304	300
Iceland	3	--	--	--	--
India[5]	10,081	9,827	10,048	10,718	10,800
Indonesia	3,655	4,200	4,250	4,120	4,400
Iran	1,087	1,119	1,115	1,088	1,020
Iraq[e]	280	532	--	30 [r]	30
Ireland[e]	443 [4]	400	--	--	--
Italy	434	391	475	532	500
Japan	1,318	1,192 [r]	1,061 [r]	1,101 [r]	1,083 [4]
Korea, North[e]	100	100 [r]	100 [r]	100 [r]	100
Korea, Republic of	385 [r]	153	119	163	150
Kuwait	400	414	444	413	440
Libya	495	533	577 [e]	577 [e]	580
Lithuania	444 [r]	468 [r]	462 [r]	424	430
Malaysia	726	848	910	843	920
Mexico	548	437	440	568	440
Netherlands	1,989	2,053	1,750 [e]	1,970 [e]	1,700
New Zealand	117	109	128	124	120
Norway	323	330	354	420	450
Oman	--	--	--	--	706
Pakistan	2,228	2,214	2,357	2,114	2,110
Peru[e]	5	5	5	5	5
Poland	1,735	1,311	1,906	1,976	2,000
Portugal	202	190	245	244	245
Qatar	1,159	1,166	1,185	1,428	1,700
Romania	949	930	1,180	1,172	1,200

See footnotes at end of table.

TABLE 12—Continued
AMMONIA: WORLD PRODUCTION, BY COUNTRY[1, 2]

(Thousand metric tons of contained nitrogen)

Country	2001	2002	2003	2004	2005[e]
Russia	8,690	8,600 [e]	9,100 [e]	9,800	10,000
Saudi Arabia	1,774	1,737	1,743	1,726	1,780
Serbia and Montenegro	66	115	62	136	135
Slovakia	215	226	230	268	270
South Africa	506	492	493	459	460
Spain	436	415	432	404	460
Switzerland	31	33	29	32	32
Syria	138	143	161	115	120
Taiwan	12	11	11	11 [e]	11
Tajikistan[e]	5	15	20	20	20
Trinidad and Tobago	3,036	3,296	3,529	3,875	4,200
Turkey	67	301	289	329	330
Turkmenistan[e]	75	85	85	85	85
Ukraine	3,700	3,700	3,900 [e]	3,900 [e]	4,300
United Arab Emirates	358	364	421	380	360
United Kingdom	850	837	1,044	1,071	1,080
United States[6]	9,120	10,300	8,450 [r]	8,990 [r]	8,040 [p]
Uzbekistan	670	740	815 [e]	840 [e]	850
Venezuela	808	666	732	1,012	900
Vietnam	53	58	80 [e]	216	220
Zimbabwe[e]	58	61	55	48	30
Total	105,000	109,000	110,000	117,000	121,000

[e]Estimated. [p]Preliminary. [r]Revised. -- Zero.

[1]World totals, U.S. data, and estimated data have been rounded to no more than three significant digits; may not add to totals shown.

[2]Table includes data available through June 18, 2006.

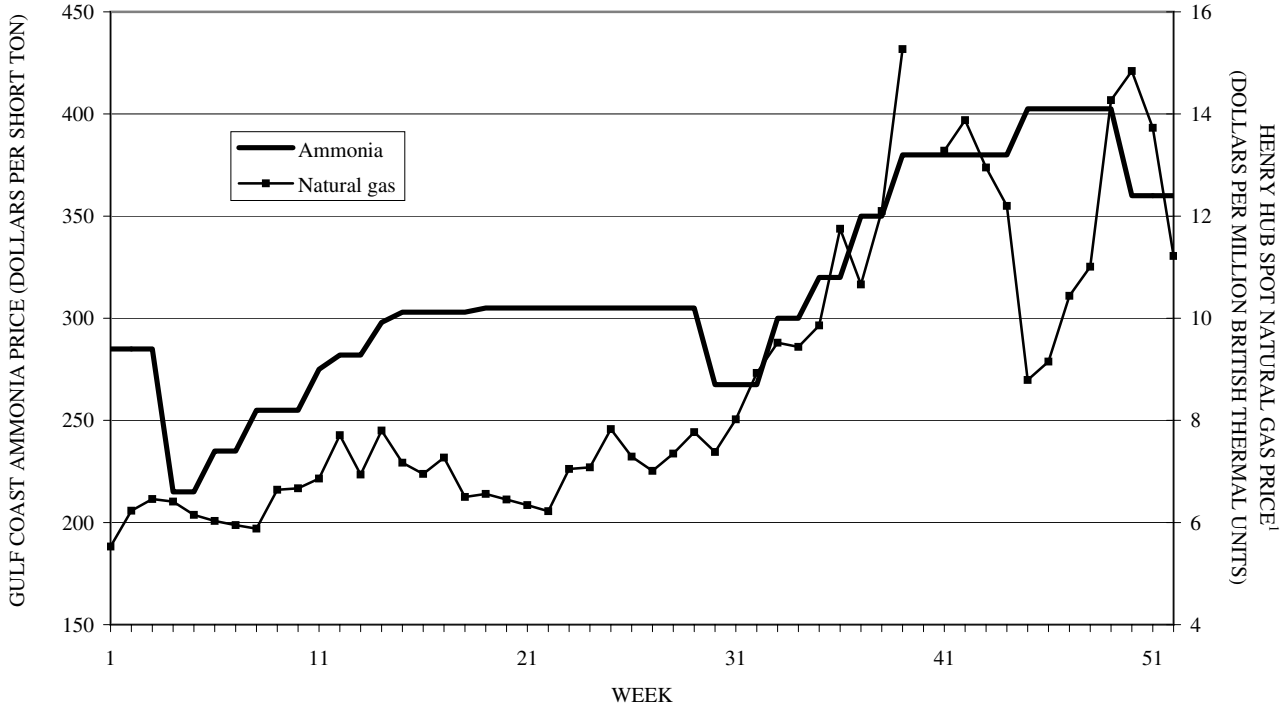
[3]May include nitrogen content of urea.

[4]Reported figure.

[5]Data are for years beginning April 1 of that stated.

[6]Synthetic anhydrous ammonia; excludes coke oven byproduct ammonia.

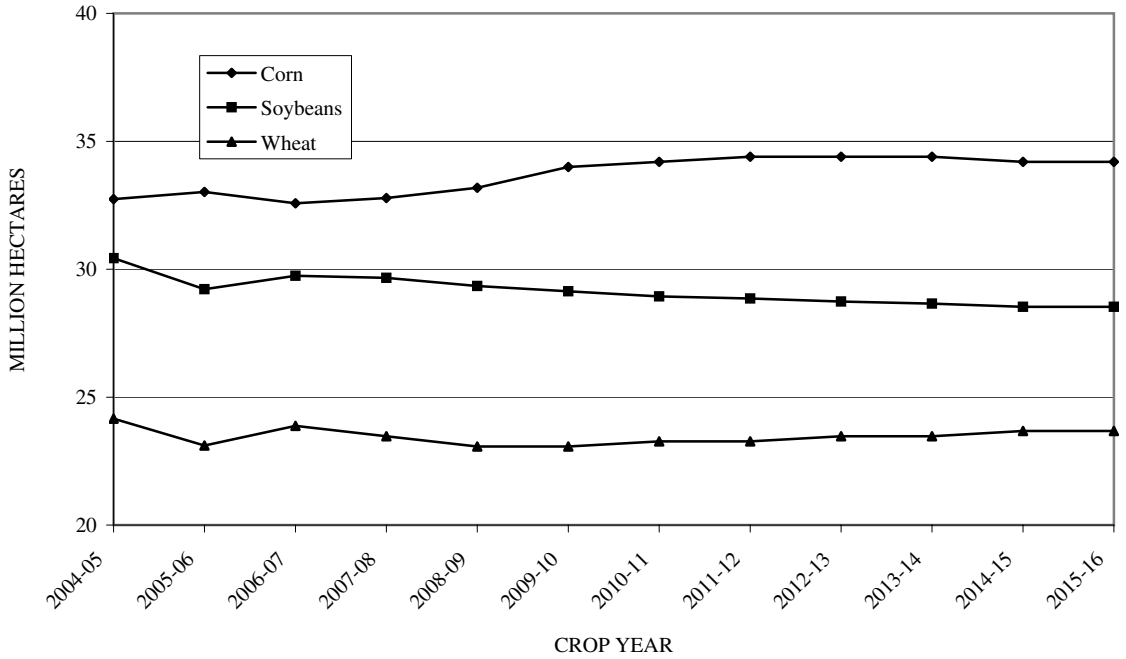
FIGURE 1
AMMONIA AND NATURAL GAS PRICES IN 2005



[1]Trading on Henry Hub was suspended from September 23 to October 6.

Sources: Green Markets and Natural Gas Weekly.

FIGURE 2
PROJECTED PLANTED ACREAGE



Source: U.S. Department of Agriculture.